

The Hamilton sandstone is a peculiar deposit of sand in the midst of a vast accumulation of shales. It covers a district extending from the Blue mountain northward for about fifty miles and eastward to the neighborhood of the Schuylkill river. Westward its limit cannot be traced, as it is destroyed by erosion, but from appearances it was as great as in the east. It lies between a mass of shale above and another mass below, and at its greatest development is about 800 feet thick, at the Susquehanna gap. Some of its beds, especially toward the middle, are very hard and flinty, but it grows more and more shaly as it recedes from this point. Apparently it exists at some distance from its point of greatest development as a sandstone mass below and another above, with intervening shales.

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*Note on a large Crustacean from the Catskill Group of Pennsylvania. By E. W. Claypole.*

*(Read before the American Philosophical Society, Sept. 21, 1883.)*

I have lately received from Mr. R. D. Lacoë, of Pittston, a slab of green sandstone, from the Catskill group of Wyoming county, containing a well-preserved head of some creature. Though not complete, yet enough remains to enable me to form a good idea of what the full form of the head must have been.

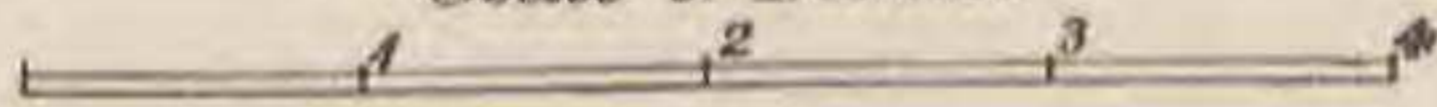
It measures eight and a half inches across the broadest part, and the same from front to back. The outline is semi-elliptical, the part preserved corresponding to a piece cut from one of the ends of an ellipse. It is somewhat distorted, and may when perfect have been more nearly semi-circular. The outline is slightly wavy, but this also may be due to distortion. Fortunately the right side is almost perfect and, being symmetrical, it is not difficult to reconstruct the other. A good idea of its general shape may be suggested to a palæontologist by saying that it resembles the head of *Cephalaspis*.

A longitudinal median ridge runs from near the front margin almost to the back of the portion preserved, dividing the head surface into two equal parts. This ridge rose near its front end into a low tubercle, or perhaps a spine, and near its hinder end into a distinct and boldly elevated spine which is, however, crushed down almost flat. Posteriorly the ridge narrows and tapers down to the general surface.

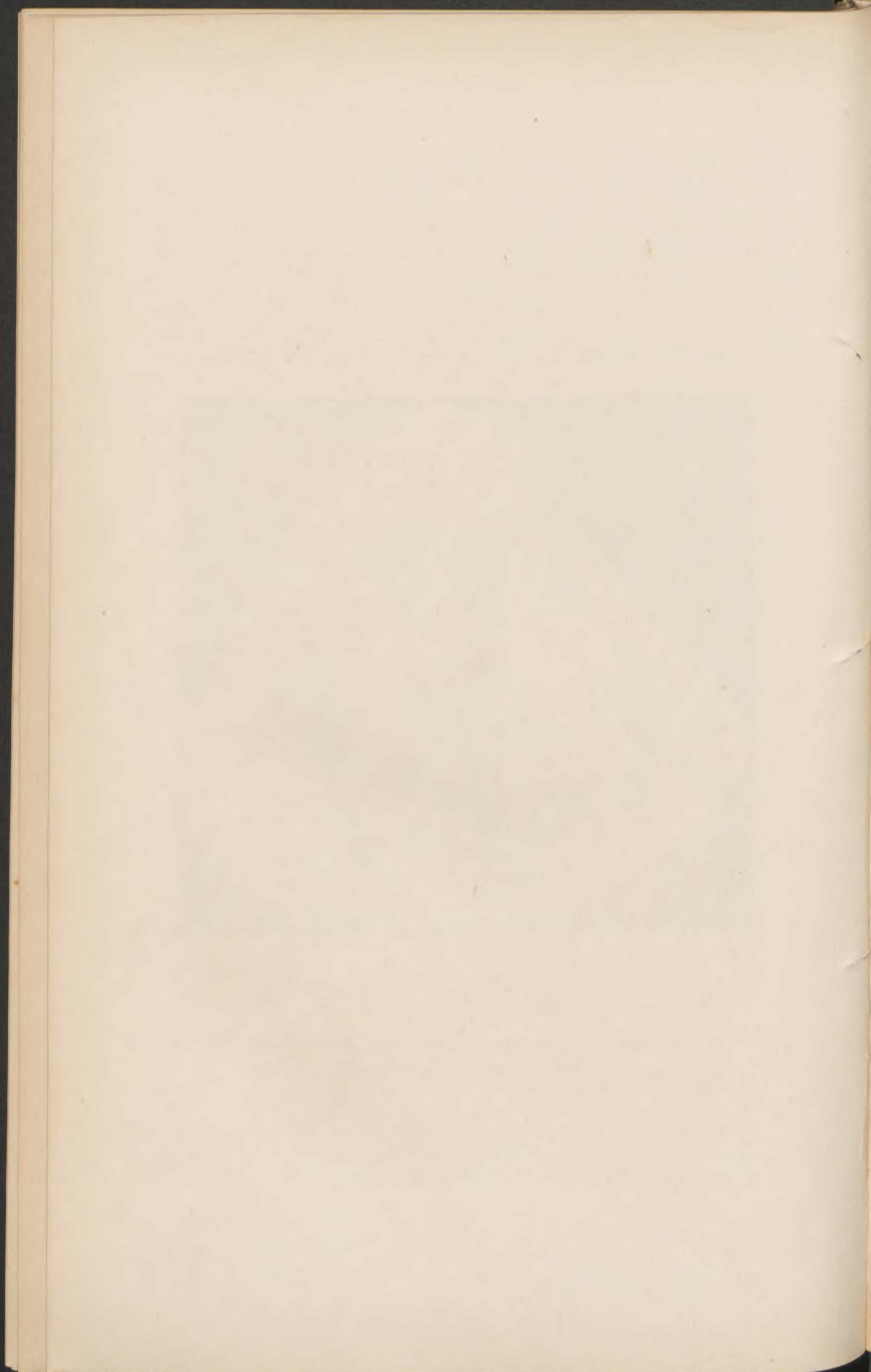
At the place of the posterior spine another ridge, less distinct, crosses the former at right-angles, and itself rises at its two ends, midway to the outer margin, into low prominences from which two semicircular ridges, convex outwardly, run curving in toward the median line at both their ends, one in front, the other behind the cross-ridge from which they start. Each cross-ridge, with its semicircular branch, resembles in outline an



*Scale of Inches.*



DOLICHOCEPHALA LACOANA, Claypole, from the Catskill rocks of Wyoming county, Pennsylvania.



anchor-shank with its two arms. Right and left of the anterior tubercle, and not quite half way between them and the margin, arise two broad, rounded prominences anteriorly, elongated and connected with the median ridge by a scarcely perceptible elevated tract.

The whole surface of the head is covered with small wrinkles or tubercles, the former chiefly in front, the latter behind, and the margin is marked by a narrow groove about one-eighth of an inch in breadth, resembling that which often marks the head of a trilobite.

No trace of bone can be found upon the specimen, so that there is no ground for supposing that it is the head of a fish. But the greater part of the surface is covered with a thin, black, perhaps carbonaceous, coating, highly suggestive of the carapace of a crustacean. This is, beyond doubt, its nature, and the fossil represents a large species hitherto unknown, and from an horizon which has thus far yielded nothing similar to it. The only crustaceans yet announced from the Catskill are some small entomostracans mentioned by the writer at the meeting of the American Association at Montreal. The specimen in question possesses therefore an unusual interest.

From so small a portion of the specimen it is difficult to assign it its exact place in the animal scale, but among the crustaceans we are led immediately to look at the allies of the existing king-crab, *Limulus*, and those of the fossil *Eurypterus* and *Pterygotus*. Both of these possess the peculiar trilobitic head-shield, and may, therefore, supply useful information concerning this species.

But the general outline of the fossil being semi-elliptical, does not well agree with that of *Limulus*, and its fossil allies, which is semicircular. Limuloid forms descend to us from Silurian days, but they all present a semicircular head-shield similar to that of the living king-crab, *Limulus Polyphemus*, or *Moluccanus*, of the east coast of America, and the Molucca islands. The same form of head-shield characterizes all the fossil genera allied to *Limulus*—*Hemiaspis*, *Bunodes*, *Euproops*, *Belinurus*, and *Halycine*. It is, consequently, impossible to refer our specimen to the dagger-tailed family of *Xyphosurans*.

Not better does the outline of the head agree with that of the rounded, oblong head-shield of *Pterygotus* and *Eurypterus*. Yet, in some respects, it reminds us of these. But the discrepancy is too great to allow of its reference to any established genus of the Eurypterids. This will be evident on an examination of the accompanying outlines.

The eyes being undiscoverable in the fossil, the important evidence which they might afford towards settling its relationship is not available, but very important and conclusive testimony is derived from the markings on the surface of the carapace. Beside the wrinkles or tubercles mentioned above, the crest is covered with small, delicate, crescentiform sculpture, resembling that which is characteristic of the Eurypterids, and a representation of which is given in the plate.